

Pepper (Wm)

REMARKS ON SOME POINTS IN THE TREATMENT OF TYPHOID FEVER.

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I HAVE no intention, in the limited time at my disposal, of entering into a full discussion of the treatment of typhoid fever in its various forms and with all its complications, but simply to state in a brief manner the results of my observation as to the management of the ordinary form of this fever, as I have met with it both in hospital and in private practice in this city and its neighborhood.

Although the attempts to isolate the particular poison of typhoid fever have not met with full success, it seems to be generally accepted that this disease is caused by a special *materies morbi*, for the most part admitted to the system through the alimentary canal, although capable, also, of gaining admittance by inhalation. I am disposed myself to believe that this poison is capable of being produced or brought into activity under conditions much more varied than it has recently been the habit to assert.

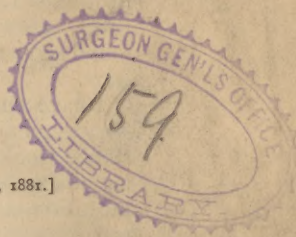
However this may be, the poison presents certain peculiarities which are important to note from their bearing upon the treatment of the disease. It is undoubtedly capable of retaining its power of infection for a long time latent, so that as soon as proper conditions are present it will manifest activity.

Carefully-observed cases also establish the fact that it is capable of producing typhoid fever although admitted to the system in very minute quantities and much diluted. It seems that the opportunities for the admission of the virus, in such small amounts as have been known to produce typical typhoid fever, must be so fre-

quent and general that a vast majority of the community must at some time or other have been exposed to it. Probably, therefore, it requires, in a degree even greater than do other zymotic poisons, suitable pabulum for its development, and a state of system predisposing to its zymotic action.

At times the virus is so concentrated and active that, in whatever way it gains entrance to the body, it infects the system in nearly every instance and causes a virulent zymosis. On the other hand, the virus may be much less active: so that, supposing it to be taken into the alimentary canal, if the secretions are normal and the glands of the mucous membrane not susceptible or vulnerable, it may be thrown off without the production of the disease. Again, the virus may be more active or more fully propagated in the intestinal canal, and cause marked irritation of the enlarged solitary and Peyerian glands of the mucous membrane, so that the intestinal lesions become considerable; and yet the virus may be arrested in the swollen mesenteric glands and no marked infection of the system occur. This agrees with the well-known fact that no constant relation exists between the degree of intestinal lesion and the intensity of the primary constitutional infection or zymosis.

It is further to be noted that even in cases where primary infection of the system has not been intense, and where the intestinal lesions have been quite marked, it is quite possible, and indeed probably quite frequent, for the morbid intestinal contents to favor further development of



the specific virus, and thus endanger continued absorption, or else for the putrid débris and secretions to give rise to a secondary non-specific septicæmia.

It thus seems to me that we must recognize practically the following different primary forms: first, ordinary typhoid fever, with moderate intestinal lesions and moderate zymosis; second, cases with grave intestinal lesions and moderate zymosis; third, cases with grave zymosis and profound constitutional symptoms from the start.

I have spoken of the first form as ordinary typhoid fever, because my own experience would indicate that this and—to a less degree—the second form are by far the most common in this district, although far too frequently individual cases or limited outbreaks of the grave primary zymotic type occur.

I have referred to these familiar views simply to call attention to the immense importance of the rôle which the gastro-intestinal mucous membrane plays in typhoid fever from the earliest moment. It is very important, also, to recognize the fact that the stadium of typhoid fever presents two stages theoretically distinct,—namely, the primary true zymotic stage and the subsequent irritative or secondary septic stage. The first of these is probably the more definite in its duration, lasting, perhaps, from twelve to sixteen days, although the data do not exist for determining its duration accurately.

In speaking of the actual treatment, I would first consider ordinary cases of typhoid fever in private practice, coming under observation at the first development of symptoms of malaise. It is my profound conviction that in a great majority of cases of this form—that is, of course, excluding those of grave primary zymosis—proper treatment of this forming-stage will modify and moderate the whole subsequent course of the case, and will prevent the development of those grave and alarming conditions to the treatment of which so much time and attention are bestowed in most discussions upon this disease.

It is universally recognized that continued exposure and efforts during the forming-stage of typhoid fever greatly increase the gravity and danger of the subsequent attack, and I have often seen patients who, after the symptoms have actually developed themselves, have been

allowed to leave the bed merely to use the close-stool or to sit in an easy-chair while the bedclothes were being changed, exhibit early and alarming exhaustion that was at least partially due to these injudicious efforts. The first essential to secure this result should be absolute rest in bed.

I have been surprised to find that some writers who begin by recommending early and complete rest make later allusions which show that their idea of such rest is far from being as thorough as I believe should be enforced. Every case in which the symptoms justify even a suspicion of typhoid fever should, in my opinion, be immediately consigned to bed and the use of the urinal and bed-pan be at once insisted upon. I have even seen such patients, when allowed to leave bed merely to use a close-stool or while the bedclothes were being changed, exhibit such exhaustion at a subsequent stage of the disease as could only be explained by these injudicious efforts. More frequently still have I seen the gastro-intestinal irritation increased seriously by the improper exposure to currents of air while out of bed.

In the next place, a most rigidly restricted diet should be insisted upon. Later in the case more abundant and concentrated nourishment and stimulants will perhaps be called for; but in this forming-stage I believe that a very limited amount of very light nourishment is sufficient, and that its use will exert a happy influence upon the subsequent course of the case. Not only should all solid food be at once forbidden, but the liquid food allowed should be light and very digestible.

Equally important is the avoidance of all irritating medicines, and especially purgatives, at this stage. It is scarcely possible that an emetic or a purgative should remove every particle of the virus from the intestinal canal, and yet we know that the virus will act even when present only in minute quantity and very dilute state if favorable conditions exist; and it is probable that the morbid secretion favored by the action of a purgative in this state of the system constitutes the best possible pabulum for the propagation of the virus, while at the same time it must render the glandular apparatus of the mucous membrane more sensitive and vulnerable. Digestion is disturbed and strength impaired, the intestinal lesions are aggravated, and the case is rendered more seri-

ous. If the state of the tongue and secretions indicates a laxative, good results will usually be obtained from the administration of the following:

R Hydrargyri chloridi mitis, gr. ii;

Sodii bicarbonatis, gr. xlviij;

M., ft. mas. et div. in pil. no. xii.

Of these one may be taken every two or three hours until the bowels are moved or until all have been taken, when a movement can be secured by an enema of tepid water or gruel.

During this early stage the remedy which seems to me most constantly called for is quinia, which I am in the habit of giving in larger doses than at the later periods of the disease, except in a particular condition. My reasons for so doing are the following: during this stage the irregular febrile movement frequently simulates a mild malarial attack, and undoubtedly a malarial element is not unfrequently present when true typhoid also exists. Again, it is probable that the use of quinine may lessen the activity of the virus and the danger and degree of infection.

If, however, the gastro-intestinal irritation is at all marked, I invariably administer the quinia by suppository, as follows:

R Quiniæ sulph., ʒi;

Pulv. opii, gr. iv;

Ol. theobromæ, q. s.

M. et div. in suppositoria no. xii.

S. One every four, six, or eight hours, while the powders above mentioned are administered by the mouth.

I have found very many attacks of mild gastro-intestinal catarrh, with or without malarial complication, with symptoms closely simulating the early ones of typhoid fever, subside rapidly under the above treatment, together with a diet of chicken- or mutton-broth, gruel, skim-milk, or milk and water in equal proportions.

If, however, the symptoms persist, it can soon be seen that a true typhoid fever is developing, and, if so, the observance of the course above described will have tended much to lessen its gravity. Of course the same absolute, scrupulous observance of rest continues essential. The diet should now be as nourishing as the state of the digestion will permit. I believe, however, that it should be liquid in character throughout the entire course of the disease.

I have repeatedly seen ill results from the infringement of this rule, while I have rarely seen a case where the digestion had been carefully managed from the start in which liquid nourishment did not suffice to maintain nutrition. Indeed, such is my conviction of the supreme importance of the condition of the mucous membranes in this disease, and of the necessity of giving only such food as can be fully digested and absorbed, that I am inclined to believe that far more patients are over-fed than under-fed in typhoid fever.

I have seen many cases where, while beef-tea and pure milk were freely administered, dryness of the tongue, nausea or vomiting, and diarrhœa existed, and where the substitution of light chicken- or mutton-broth, and of skim-milk, or milk diluted with equal parts of water, has led to the subsidence of these symptoms and the re-establishment of good digestion.

With regard to the use of stimulants, I have been led to feel that they are not to be regarded as a necessary part of the routine treatment of typhoid fever. During the early stage of the disease, indeed,—unless exceptional symptoms arise demanding them,—their use is often injurious and tends to increase the derangement of digestion and the gastro-intestinal catarrh then existing. When the early stage is carefully managed, stimulants are often not called for throughout the whole course of the case, or only towards the close to hasten convalescence. On the other hand, in cases where the constitutional infection is serious, and marked nervous prostration and heart-failure exist, their free use may be demanded. No question in the treatment of typhoid fever has seemed to me to rival in difficulty that of deciding, in cases which do not come under notice until high hyperpyrexia, serious nervous symptoms, a rapid and feeble circulation, together with marked derangement of digestion, have supervened, how far these symptoms are the result of nervous exhaustion from protracted surface irritation which may be increased by the free use of stimulants, and how far they are the result of poisoning of the nerve-centres and depression of the vital forces by the zymotic poison.

In such cases it is probably better to use stimulants at once, but with the greatest caution and with a mind fully awake to the fact that their use may aggravate the

very symptoms they are given to relieve. Where the case has been under observation from the very beginning, and stimulants have been withheld until the appearance of symptoms actually demanding them, it is generally a comparatively easy matter to determine when they are called for, and to decide in what form and to what extent they shall be given.

In every case of typhoid fever the febrile movement should be carefully watched, and the temperature be recorded two or three times in twenty-four hours,—say at 9 A.M., 2 P.M., 9 P.M. In many cases no special treatment is called for to reduce the temperature. If the primary zymosis is not violent, and the gastro-intestinal irritation is moderated by proper means, the febrile movement preserves its well-known course without the maxima attaining, in most cases, a dangerous point. So long as the temperature fluctuates 2° or thereabouts within each twenty-four hours, and the maximum alone, lasting for a few hours or less, reaches 102° to $103\frac{1}{2}^{\circ}$, while the nervous symptoms and the heart's action are reasonably favorable, no special anxiety need be felt about the pyrexia. This is especially true in women with sensitive nervous systems and in children, since in them high temperatures are most readily produced and have less serious significance. It is, however, desirable for the comfort of the patient and for the promotion of healthy action of the skin that the surface should be sponged several times daily. The water may contain a little alcohol, vinegar, or carbolic acid, and its temperature should be determined by that of the body and by the sensations of the patient. For instance, in a highly-nervous and delicately-organized young woman of 25 years, with marked typhoid fever in which the maximum daily temperature reached 104° , $104\frac{1}{2}^{\circ}$, even 105° , for ten or twelve days successively, sponging even with tepid water produced a sense of chilliness, so that it was entirely abandoned, and a perfectly satisfactory recovery was made. I am entirely convinced that any "cold-water treatment" of typhoid fever, with rigid rules for cool bathing, etc., as soon and as often as the temperature reaches a certain point ($102\frac{1}{2}^{\circ}$ to $103\frac{1}{2}^{\circ}$ or so on), is unphilosophical, unnecessary, and less successful than the simpler mode of treatment here advocated. The excellent results obtained by some of the

advocates of frequent cool bathing show that such baths are well borne and may be safely conjoined with a scrupulous attention to all the other details of rational treatment. But I have preserved the notes of the last one hundred cases of typhoid fever of whose treatment I have had the direction from the beginning of the attack, and the mortality has been but three per cent., and in only five or six of these cases were full baths employed. In the great majority of cases, then, I believe that cool bathing can be dispensed with, and sponging of the surface be found sufficient. But, on the other hand, there are certain conditions that seem to call imperatively for rapid reduction of temperature by cold baths. The first of these is when, early in the case, the temperature rises very high ($104\frac{1}{2}^{\circ}$ or over) without any sufficiently severe local irritation to explain it, so that there is clearly a grave zymosis present. Again, when at any period of the disease the daily maximum reaches $105\frac{1}{2}^{\circ}$, and the daily average is very high, and the hyperpyrexia is maintained despite the free use of cool sponging and the judicious use of antipyretics, cool bathing should, as a rule, be instituted. I follow this rule whether the hyperpyrexia is due apparently to increased septicæmia or to the failure of the inhibitory action of the nervous system; but if severe pulmonary inflammation or a serious exacerbation of intestinal inflammation has occurred to cause it, I do not advise the use of cool baths until the character of the nervous symptoms or the failure of the force of cardiac action indicates that the exalted temperature is producing dangerous secondary results. A few words must be added in regard to the use of other means for reducing hyperpyrexia. Undoubtedly, quinine is the most reliable of these. I have already spoken of its use in the later stages of the disease, either by mouth or rectum, and I think its judicious use thus greatly lessens danger of hyperpyrexia later. When, however, the temperature runs up as the disease advances, it does not seem to me advisable to give large single doses of quinia, but to persevere with the use of twelve to twenty-four grains given in divided doses during the twenty-four hours. The elevation of temperature is so frequently connected with the evolution of gastro-intestinal lesions that it appears desirable to avoid any measure liable to

increase this surface irritation. The administration of colossal doses of quinia (twenty-five to forty grains at a single dose), while capable in some cases of lowering the excessive temperature, it seems to me has in more than one instance shown itself to be open to serious objection. If, however, the temperature persistently rises despite absolute rest, judicious diet, the regular use of quinine in moderate doses, repeated sponging, and if any special reason exists why cool bathing should not be used, or if after cool baths have been used the dangerous hyperpyrexia persists, then only would I recommend the administration of very large doses of quinia; nor would I use them even then unless the state of the stomach encouraged the hope that severe gastric irritation would not result. Digitalis, which is very valuable where failure of the innervation of the heart exists, has not, in my experience, proved itself reliable as an antipyretic or a tonic to the heart when its feeble action results from degeneration of the muscular walls from hyperpyrexia. Salicylic acid and its salts have also disappointed me, often failing to reduce the temperature satisfactorily, and often causing a most unsatisfactory amount of gastro-intestinal irritation.

To return from this consideration of the treatment of the pyrexia in typhoid fever, there is one other condition, and only one, that seems to me to demand attention in every case of this disease. Pulmonary or venous complications may or may not exist in any pronounced degree, but unquestionably there is wide-spread irritation of the gastro-intestinal mucous membrane in every case. This may or may not be so intense as to prove the source of the greatest danger in the case, it may not be associated with severe diarrhoea,—nay, there may not be the slightest diarrhoea present,—and yet there is always hyperæmia and follicular enlargement. Differences between individual constitutions, as well as differences in the degree of these local lesions, cause them to exist in different degrees of reflex irritation, and thus to influence very differently the symptoms and course of the case; but the essential fact is that they are present in every case to an unknown extent, and the obvious inference would seem to be that they should receive suitable treatment in every case.

My own feeling is that this treatment

should be instituted as soon as reasonable suspicion exists that the case is one of typhoid fever, and that it should, if possible, be steadily maintained until it may be thought that the mucous membrane has returned to its healthy state. It seems to me altogether probable, even despite the presence of a special poison in the intestinal contents, that some control can be exercised over the extent and progress of these local lesions; and I must add that prolonged clinical observation has convinced me of the truth of this view. The substances which would seem most appropriate for this purpose are the salts of silver and of bismuth and creasote or carbolic acid. Of these my own preference is very decidedly for nitrate of silver, the use of which now constitutes an essential and, in my judgment, a most important part of my treatment of typhoid fever. After the preliminary measures before described, I direct nitrate of silver in the dose of one-quarter or one-sixth of a grain for an adult, usually in pill, or for children in solution in mucilage of acacia three or four times daily, to be taken soon after food. If the bowels are constipated, extract of belladonna is combined; if a tendency to looseness exists, a small amount of powdered opium is added. When given in solution, the opium is added in the form of a few drops of deodorized laudanum. Since I was led to the adoption of this remedy by the study of the morbid anatomy of typhoid fever, I have acquired a constantly-increasing confidence in its value as an element of the rational treatment of this disease. By modifying, as I believe it does, the state of the mucous membrane, it modifies the symptoms that are dependent on the irritation reflected from the mucous membrane; and the result has seemed to me to be that in a long series of cases treated with most scrupulous attention to every detail, and in all of which nitrate of silver was administered, there has been a remarkable freedom from grave complications and a most gratifying percentage of recoveries (ninety-seven per cent.).

As may be inferred from the above remarks, there does not seem to me any objection to the judicious use of opium in typhoid fever. Not only have I seen it useful in checking diarrhoea, but it has often proved the most valuable remedy for the insomnia, headache, and excessive nervous excitability that may be present in

this disease. It is true that I have known one of the bromides or chloral or spirit of chloroform produce good results in some cases where such symptoms existed, but far more frequently I have succeeded in relieving them by the use of carefully graduated small doses of deodorized laudanum, given alone, or with sweet spirit of nitre, or with a moderate dose of bromide of potassium. Not until opium has failed, unless decided constipation exists, do I resort to the use of chloral or the bromides alone.

Time will not allow me to allude in detail to the measures which have proved, in my experience, most valuable in the treatment of the numerous complications of typhoid fever. When bronchitis becomes severe or pneumonia ensues, I substitute carbonate of ammonia for the nitrate of silver, continuing the use of full doses of quinia, increasing the amount of alcohol, and avoiding the use even of sponging with cool water unless the temperature goes over 105° Fahr.

By the observance of a very carefully regulated diet and the early use of nitrate of silver with minute doses of opium, the occurrence of troublesome diarrhoea is ren-

dered rare. When it does occur, the diet should be even more carefully guarded and the amount of opium be increased, and, if necessary, acetate of lead, or a carefully prepared mixture of chalk and bismuth, with an opiate, be administered. Tympanitic distention of the abdomen often results from the fermentation of excessive or unsuitable food, and will be relieved by modification of the diet, and the administration of some such combination as the following:

R Creasoti purificat., gtt. v vel x;
Bismuthi subnitratis, \mathfrak{z} i vel \mathfrak{z} iss;
Tinct. cardamomi comp., \mathfrak{f} 3iij;
Aquaë, q. s. ad \mathfrak{f} 3v.

M. One tablespoonful every six hours.

But often also it comes from a quasi-paralytic condition of the intestinal coats which renders them incapable of resisting the expansive force of the gas enclosed. It is when tympanitis is due to this latter cause, and associated with the general symptoms of prostration and with ~~waste~~ *marked* development of the typhoid state, but without much diarrhoea, that the internal use of oil of turpentine in emulsion (ten drops every three or four hours) will usually produce excellent results.

